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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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| 08/878,433 | 06/18/97 | FLAHERTY | A 65112/9484V3 |

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PM31/0901

EXAMINER

ACKERMAN, W

ART UNIT

PAPER NUMBER

3626

11

DATE MAILED: 09/01/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

| | | |
|------------------------------|--------------------------------------|----------------------------------------|
| Office Action Summary | Application No. 08/878,433 | Applicant(s) Flaherty et al. |
| | Examiner William Ackerman | Group Art Unit 3626 |

Responsive to communication(s) filed on _____.

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 1-18 and 23-27 is/are pending in the application.

Of the above, claim(s) 18, 23, and 24 is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 1-17 and 25-27 is/are rejected.

Claim(s) _____ is/are objected to.

Claims 18, 23, and 24 are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on Jun 18, 1997 is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) _____.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). 7

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-17 and 25-27, drawn to an aerospace housing and shaft assembly and seal assembly, classified in class 277, subclass 400.
 - II. Claims 18, 23 and 24, drawn to a method of producing a seal assembly, classified in class 29, subclass 444.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions a method of producing a seal assembly, Group II, and an aerospace housing and shaft assembly and seal assembly, Group I, are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as machining the hydropads.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Dave Smith on 8-11-98 a provisional election was made with traverse to prosecute the invention of an aerospace housing and shaft assembly and seal assembly, Group I, claims 1-17 and 25-27. Affirmation of this election must be made by

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applicant in replying to this Office action. Claims 18, 23 and 24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

Information Disclosure Statement

1. Information Disclosure Statement has been considered. Sedy, U.S. Patent No. 4,212,475 which was listed on form PTO-1449 was not considered since a copy was not provided. 37CFR1.98(a)(2).

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Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 32. Correction is required.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 31. Correction is required.

Specification

4. The disclosure is objected to because of the following informalities: "syrface" page 5, line 3 should be --surface--, page 5, line 28, "32" should be --31--, "mating ring 26" page 5, line 34 should be --mating ring 28--, "lubricating fluid region 38" page 6, line 18 is not clear and should be --lubricating fluid region 42--, "ambientlow" page 10, line 17; and page 12, line 13 should be --ambient low--, "wherein said wherein said" page 12, line 17 should be --wherein said--.

Appropriate correction is required.

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 10-12 and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Ludwig U.S. Patent No. 3,675,935. Ludwig '935 shows a housing 42, a shaft rotatably mounted within said housing 42, a seal assembly between housing and shaft 10. A first seal ring 20 mounted on the housing 42, a second seal ring mounted on the shaft facing the first seal ring 20, one of the seal rings includes a surface defining a hydropad 54, the hydropad facing the other seal ring and positioned so that it is exposed to ambient low pressure air (col. 4, line 30). The hydropad is positioned to pump low pressure air from the inner diameter of the seal assembly toward the outer diameter (col. 2, lines 32-38). The low pressure air acts on the inner diameter of the seal assembly (col. 2, lines 12-13). The outer diameter of the seal assembly is exposed to lubricating fluid (col. 2, line 55). A first seal ring of a generally annular shape 20 and a second seal ring 18 facing the first seal ring 20 wherein one seal ring includes a plurality of hydropads 54. The hydropads include an inner edge oriented substantially circumferentially (fig.4), an outer edge oriented substantially circumferentially 58 and spaced radially outward from the inner edge, a leading edge interconnecting the inner with the outer edge (see fig. 4), the leading edge being substantially straight and oblique to the radial direction, and a trailing edge interconnecting the

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inner edge with the outer edge, the trailing edge being substantially straight and oblique to the radial direction 52. The inner and outer edges are both substantially straight. The leading edge is positioned at an angle relative to a radial axis passing through a mid-point of the leading edge, and wherein the trailing edge is positioned at the same angle relative to a radial axis passing through a corresponding mid-point of the trailing edge (see fig. 4).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6, 7, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludwig '935. Ludwig '935 shows a low pressure side of ambient air. Ludwig '935 does not specifically recite that the low pressure air has a pressure less than about 10 psia or less than about 5 psia. It would have been an obvious matter of design choice to modify Ludwig '935 by having the low pressure air less than about 10 psia or less than about 5 psia, since applicant has not disclosed that having the low pressure air at the specific pressures solves any stated problem or is for any particular purpose. The selection of the low pressure air as less than about 10 psia or less than about 5 psia appears to be a function of the environment the seal is used in and not a

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function of the seal itself, thus the seal does not depend on the selection of the particular pressure of the low pressure air.

9. Claims 8, 9, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludwig '935 in view of Nylykke U.S. Patent No. 4,099,729. Ludwig '935 shows all of the limitations of the claims as shown above except the second seal ring comprising a ductile metallic material, and the first seal ring comprises a carbon material. Nylykke shows a second seal ring comprising a ductile metallic material 5 and a first seal ring comprising a carbon material 18 in an analogous art for the purpose of mating the two sealing rings. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the seal assembly of Ludwig '935 with a second ring of ductile metallic material and a first seal ring of carbon material as taught by Nylykke in order to mate the two sealing rings.

10. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ludwig '935 in view of Takenaka U.S. Patent No. 5,538,260. Ludwig '935 shows all of the limitations of the claim except the low pressure air is atmospheric air. Takenaka shows the low pressure air is atmospheric air (col. 8, line 18) in an analogous art for the purpose of operating at altitude. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the seal assembly of Ludwig '935 with the low pressure air being atmospheric air as taught by Takenaka in order to operate the seal at altitude.

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Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ludwig, Heinrich, Gardner, Ludwig et al. U.S. Patent No. 3,782,737, Sedy, Takenaka et al. U.S. Patent No. 4,407,513, Takenaka et al. U.S. Patent No. 4,423,879, Kimura et al., Takenaka et al. U.S. Patent No. 5,312,117 and European Patent 0369,295 are cited to show similar "pumping" seals, hydropad configurations and working fluids at similar pressures.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William Ackerman whose telephone number is (703) 308-7908.



Anthony Knight
Supervisory Patent Examiner
Group 3600

WGA

August 27, 1998